Prince Sultan University

Department of Mathematical Sciences

MATH 113 – First Examination

12 November 2008

Time allowed: 45 minutes   Dr. Bahaa Eldin Abdalla

Maximum points: 30 points

1. (15 points) Evaluate each integral.

    (a) $\int \left(2 - x^2\right)^2 dx$

    (b) $\int \dfrac{\sec x + \cos x}{2\cos x} dx$

    (c) $\int x\sqrt{3 + x}\, dx$

(d) $\displaystyle\int_{-1}^{1} \frac{x^2 dx}{\sqrt{x^3 + 9}}$

2. (3 points) Express $\displaystyle\sum_{k=1}^{n}\left(\frac{4}{n} - \frac{6k^2}{n}\right)$ in closed form.

3. (4 points) Find the total area between the curve $y = x^3$ and the x-axis over the interval $[-1,3]$.

4. (4 points) Use the definition to find the area under $f(x) = 2x+1$ over $[1,3]$.

5. (4 points) A particle moves with acceleration $a(t) = \sin t$ along an s-axis and has velocity $v_0 = 1$ at time $t = 0$. Find the displacement traveled by the particle during $-\pi/4 \leq t \leq \pi/2$.